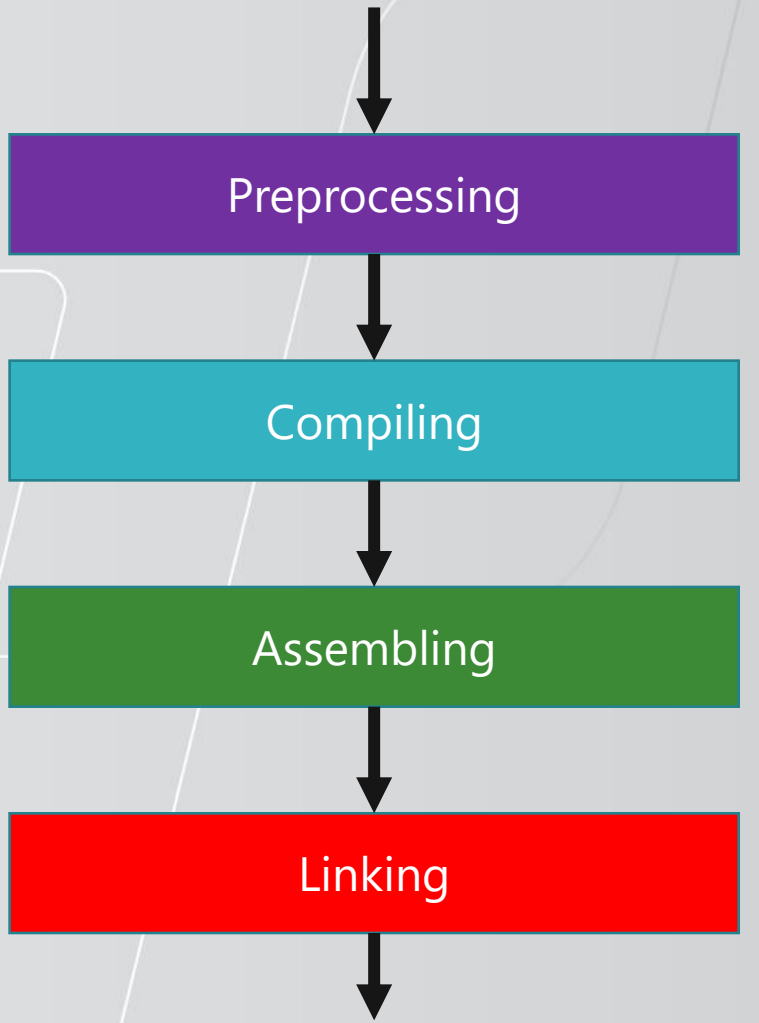
Compilation Process



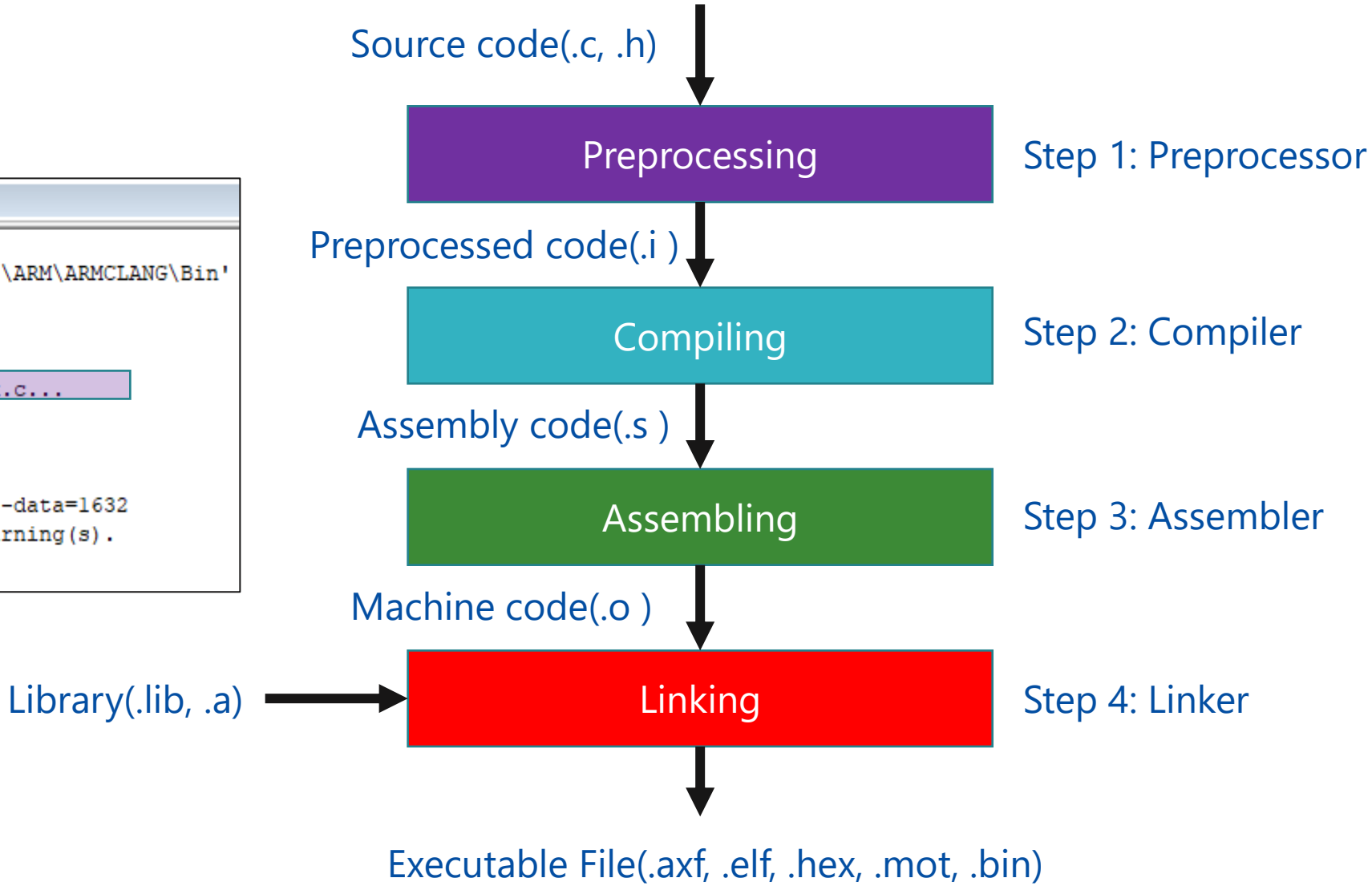
09 Nov 2024

OUTLINE

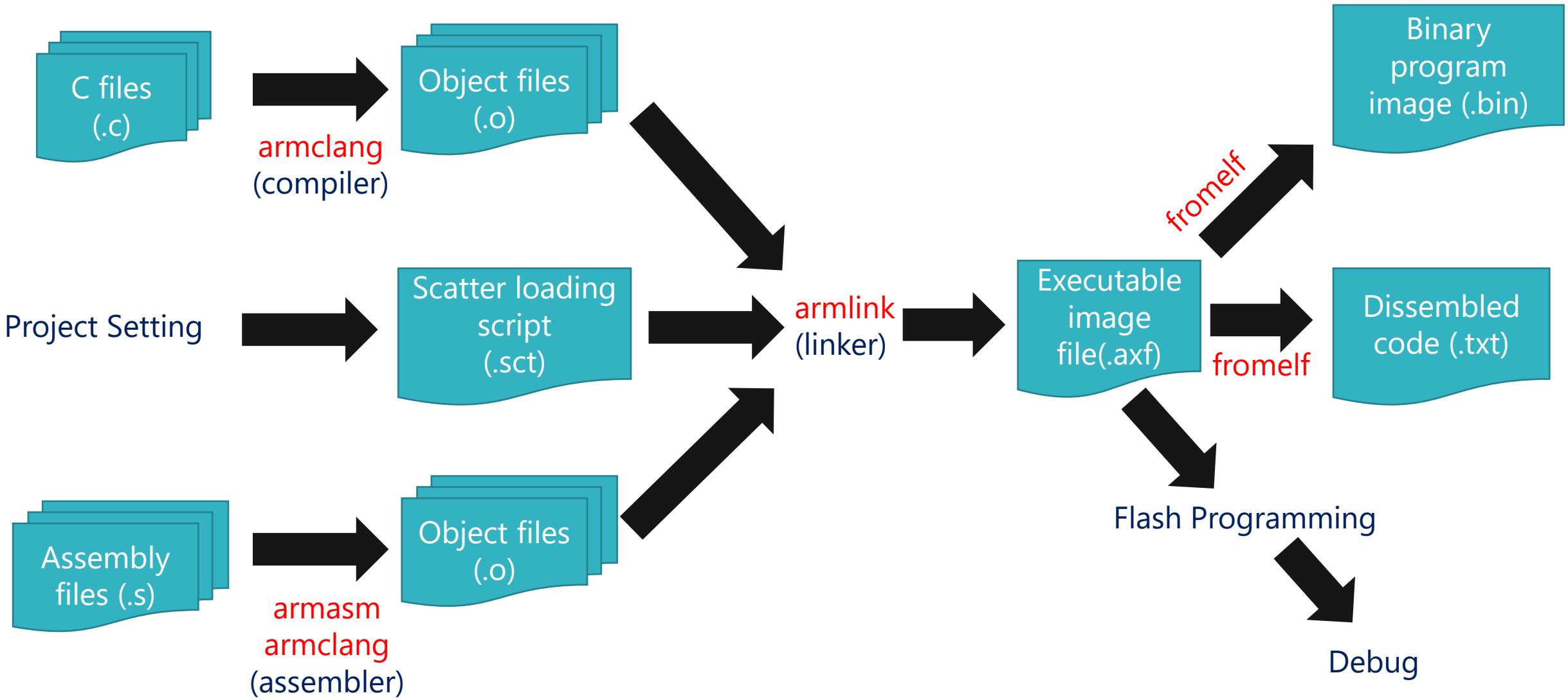
1. Compilation Process
2. Step 1: Preprocessor
3. Step 2: Compiler
4. Step 3: Assembler
5. Step 4: Linker
6. ARM image conversion utility

1. Compilation Process

```
Build Output
Rebuild started: Project: buildProgram
*** Using Compiler 'V6.18', folder: 'C:\Keil_v5\ARM\ARMCLANG\Bin'
Rebuild target 'Target 1'
creating preprocessor file for main.c...
compiling main.c...
creating preprocessor file for system_stm32f4xx.c...
assembling startup_stm32f429xx.s...
compiling system_stm32f4xx.c...
linking...
Program Size: Code=376 RO-data=444 RW-data=0 ZI-data=1632
".\Objects\buildProgram.axf" - 0 Error(s), 0 Warning(s).
Build Time Elapsed:  00:00:01
```



1. Compilation Process



Step 1: Preprocessor

armclang
--target=arm-arm-none-eabi
-mcpu=cortex-m4
-E
-I<Path folder contain header file(option)>
<source file(.c)>
-o
<file output(.i)>

armclang --target=arm-arm-none-eabi -mcpu=cortex-m4 **-E** main.c -o main.i

Step 2: Compiler

armclang
--target=arm-arm-none-eabi
-mcpu=cortex-m4
-s
<Preprocessed code (.i)>
-o
<File output(.s)>

armclang --target=arm-arm-none-eabi -mcpu=cortex-m4 **-S** main.i -o main.s

Step 2: Compiler

armclang
--target=arm-arm-none-eabi
-mcpu=cortex-m4
-c
<Preprocessed code (.i) or source file(.c) >
-o
<file output(.o)>

armclang --target=arm-arm-none-eabi -mcpu=cortex-m4 **-c** main.i -o main.o

armclang --target=arm-arm-none-eabi -mcpu=cortex-m4 **-c** main.c -o main1.o

Step 3: Assembler

armclang
--target=arm-arm-none-eabi
-mcpu=cortex-m4
-masm=auto
-c
<Assembly code (.s)>
-o
<File output(.o)>

armclang --target=arm-arm-none-eabi -mcpu=cortex-m4 -masm=auto **-c** startup_stm32f429xx.s -o st.o

Step 4: Linker

armlink
--scatter=<Scatter File.sct>
--cpu=cortex-m4
--info sizes
--symbols
--info totals
--info unused
……..
--map --list=<image.map>
<Object files (*.o)>
-o
<File output(.axf)>

armlink --scatter=STM32F4.sct --cpu=cortex-m4 --info sizes --symbols --info totals --info unused --map --list= STM32F4.map main.o startup.o -o out.axf

ARM image conversion utility

fromelf [Flags] input_file

Flags for Text Information

-v	verbose
-a	print data addresses (For images built with debug)
-c	disassemble code
-d	print contents of data section
-e	print exception tables
-g	print debug tables
-r	print relocation information
-s	print symbol table
-t	print string table
-y	print dynamic segment contents
-z	print code and data size information

fromelf –c main.o

fromelf –c main.o >dumobject.txt


Thank you